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Xiaohua Shi

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EXAMINER

NAHAR, QAMRUN

ART UNIT

PAPER NUMBER

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/791,004	<b>Applicant(s)</b> SHI ET AL.	
	<b>Examiner</b> QAMRUN NAHAR	<b>Art Unit</b> 2191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

1. This action is in response to the amendment filed on 01/22/2009.
2. The objection to the specification is withdrawn in view of applicant's amendment to the specification filed on 02/07/2008.
3. Claims 6, 14 and 22 have been amended.
4. Claims 1-24 are pending.

***Response to Amendment***

***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1-8 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-8 are directed to a method. However, the recited steps of the method are held to be non-statutory subject matter because the recited steps of the method are (1) not tied to another statutory class (such as a particular apparatus) or (2) not transforming the underlying subject matter (such as an article or materials) to a different state or thing. Applicant is advised to amend the claims to recite "[a] computer-implemented method" in order to overcome the § 101 rejections.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hertling (US 2002/0188935) in view of Ruf (U.S. 6,665,865).

**Per Claim 1:**

Hertling teaches determining an age of an equivalence class; and updating the equivalence class based on the age of the equivalence class (“... determine the age of the required class file ... if the class file is older than acceptable age, a more recent version of the class file will be sought on the class file repository. ...” in par. 0024). Hertling does not explicitly teach cloning the equivalence class. However, Ruf teaches cloning the equivalence class (“... The following actions are employed in determining whether to create a new copy of a method: ... 4. If the new procedure signature has not been encountered before, create a new copy of the method for later optimization and enqueue a request to specialize the copy of the new procedure signature. The call site is also modified to invoke the appropriate specialized procedure.” in column 15, line 39 to column 16, line 3).

It would have been obvious to one having ordinary skill in the computer art at the time of the invention was made to modify the method disclosed by Hertling to include cloning the equivalence class using the teaching of Ruf. The modification would be obvious because one of

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ordinary skill in the art would be motivated to perform an alias analysis on a program using a compact, equivalence-class-based representation (Ruf, column 2, lines 12-15).

**Per Claim 2:**

The rejection of claim 1 is incorporated, and Ruf further teaches wherein the equivalence class is associated with an escape analysis (column 6, lines 8-20).

**Per Claim 3:**

The rejection of claim 1 is incorporated, and Hertling further teaches wherein determining the age of the equivalence class includes an initialization operation (par. 0014, lines 1-5).

**Per Claim 4:**

The rejection of claim 1 is incorporated, and Hertling further teaches wherein determining the age of the equivalence class includes incrementing the age of the equivalence class in response to a cloning operation (par. 0022).

**Per Claim 5:**

The rejection of claim 1 is incorporated, and Hertling further teaches wherein determining the age of the equivalence class includes selecting the age of the equivalence class to be a greater age of first and second ages associated with respective merged equivalence classes (par. 0020).

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**Per Claim 6:**

The rejection of claim 1 is incorporated, and Ruf further teaches wherein cloning the equivalence class based on the age of the equivalence class includes associating the equivalence class with one of an old equivalence class or a young equivalence class (column 9, lines 62-67).

**Per Claim 7:**

The rejection of claim 6 is incorporated, and Hertling further teaches further comprising associating the equivalence class with the old equivalence class in response to the age of the equivalence class being greater than or equal to an age threshold (par. 0021).

**Per Claim 8:**

The rejection of claim 6 is incorporated, and Hertling further teaches further comprising associating the equivalence class with the young equivalence class in response to the age of the equivalence class being less than an age threshold (par. 0021).

**Per Claims 9-16:**

These are system versions of the claimed method discussed above (claims 1-8, respectively), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also obvious.

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**Per Claims 17-24:**

These are machine accessible medium versions of the claimed method discussed above (claims 1-8, respectively), wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also obvious.

***Response to Arguments***

9. Applicant's arguments filed on 01/22/2009 have been fully considered but they are not persuasive.

*In the remarks, the applicant argues that:*

a) In the official action, it is suggested that the "modification would be obvious because one of ordinary skill in the art would be motivated to perform an alias analysis on a program using a compact, equivalence-class-based representation." Office Action dated October 22, 2008, p. 3, ¶ 2. On the contrary, the techniques described by Hertling et al. do not require a complex analysis such as the alias analysis of Ruf. That is, while Ruf describes "performing an alias analysis for each procedure in the closure of code to determine a polymorphic summary of each procedure, and utilizing the polymorphic summary to specialize each procedure in the closure of code," Hertling et al. describe analyzing class files by comparing the creation date of a required class file to a current calendar date to determine the age of the required class file. A more complex analysis such as the alias analysis of Ruf is not necessary or even useful to carry out the techniques described by Hertling et al.

*Examiner's response:*

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a) In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious to one having ordinary skill in the computer art at the time of the invention was made to modify the method disclosed by Hertling to include cloning the equivalence class using the teaching of Ruf. The modification would be obvious because one of ordinary skill in the art would be motivated to perform an alias analysis on a program using a compact, equivalence-class-based representation (Ruf, column 2, lines 12-15).

*In the remarks, the applicant argues that:*

b) In addition, Ruf describes creating a new copy of a method based on whether a new procedure signature has not been encountered before (Ruf, 15:65-16: 3), while Hertling et al. describe replacing class files based on age (Hertling et al., ¶ [0024]). The previous-encounter test of Ruf is not satisfied using the age test of Hertling et al. That is, creating a new copy as described by Ruf based on age as described by Hertling et al. would not work to create new copies as needed by Ruf. That is, the age of a class file has no bearing on whether the class file was previously encountered. Using the Hertling et al. age test as a basis for creating new copies would result in instances in which new copies of class files are never created (regardless of whether the class files were or were not previously encountered) and other instances in which



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many new copies of a single class file are repeatedly created (regardless of whether the class file was or was not previously encountered). Such results would be of no use due to their unpredictable nature. Thus, the Applicants respectfully submit that the motivation suggested in the official action would not lead one of ordinary skill in the art to make the suggested combination of Hertling et al. and Ruf.

Further, Hertling et al. describe replacing class files to provide the most recent versions of the class files. Hertling et al., ¶ [0024] ("... the virtual machine replaces class files in the file system..." and "By automatically replacing outdated class files, the virtual machine of the invention constantly insures that the most-recent version of each class file is present in the file system.") (emphasis added). Ruf describe creating new copies of methods. Ruf, 15:30-16:3. Modifying Hertling et al. in view of Ruf as suggested would cause the Hertling et al. system to create two or more copies of an outdated version of a class file rather than providing the most recent version of the class file as described by Hertling et al. This would be contrary to the techniques of Hertling et al. that are described as providing most recent class file versions by replacing old versions. The suggested combination of Hertling et al. and Ruf would lead to a system where the most recent versions of class files would not be available, but instead multiple copies of old versions of class files would be created.

*Examiner's response:*

b) In response to applicant's argument that "Ruf describes creating a new copy of a method based on whether a new procedure signature has not been encountered before (Ruf, 15:65-16: 3), while Hertling et al. describe replacing class files based on age (Hertling et al., ¶ [0024]). The

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previous-encounter test of Ruf is not satisfied using the age test of Hertling et al. That is, creating a new copy as described by Ruf based on age as described by Hertling et al. would not work to create new copies as needed by Ruf', the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

*In the remarks, the applicant argues that:*

c) The combination would not even be obvious to try, because it would go against common sense as it would have no use and would instead have adverse results. See Hertling et al., ¶ [0006] and [0007] (Explaining that not providing customers with upgraded software would generate "customer ill will when software incompatibilities arise," and further explaining that "if developers do not earnestly attempt to keep their users updated with the most-recent versions or newest class files, errors may arise when virtual machine applications need a particular class file that the user does not have."). Hertling et al. teach away from keeping outdated class file versions and instead describe updating class file versions by replacing old versions of class files. Making multiple copies of an outdated version of a class file would be counterintuitive and counterproductive to the techniques described by Hertling et al.

In view of the foregoing, the Applicants respectfully submit that one of ordinary skill in the art would not make the suggested combination of Hertling et al. and Ruf. Accordingly, the Applicants respectfully submit that Hertling et al. and Ruf do not render independent claim 1

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prima facie obvious and submit that independent claim 1 and all claims dependent thereon are in condition for allowance.

*Examiner's response:*

c) In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious to one having ordinary skill in the computer art at the time of the invention was made to modify the method disclosed by Hertling to include cloning the equivalence class using the teaching of Ruf. The modification would be obvious because one of ordinary skill in the art would be motivated to perform an alias analysis on a program using a compact, equivalence-class-based representation (Ruf, column 2, lines 12-15).

*In the remarks, the applicant argues that:*

d) The Applicants respectfully submit that independent claim 9 is also allowable over the art of record. Claim 9 is directed to a system that includes a processor coupled to a memory and configured to determine an age of an equivalence class and clone the equivalence class based on the age of the equivalence class. The Applicants respectfully submit that Hertling et al. and Ruf

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do not render claim 9 prima facie obvious for at least the reasons discussed above in connection with claim 1.

Accordingly, the Applicants respectfully submit independent claim 9 and all claims dependent thereon are in condition for allowance.

*Examiner's response:*

d) The Examiner has addressed applicant's arguments regarding claim 1 in the Examiner's Responses (a) thru (c). See the Examiner's Responses (a) thru (c) above.

*In the remarks, the applicant argues that:*

e) The Applicants respectfully submit that independent claim 17 is also allowable over the art of record. Claim 17 is directed to a machine accessible medium having instructions stored thereon that, when executed, cause a machine to determine an age of an equivalence class and clone the equivalence class based on the age of the equivalence class. The Applicants respectfully submit that Hertling et al. and Ruf do not render claim 17 prima facie obvious for at least the reasons discussed above in connection with claim 1.

Accordingly, the Applicants respectfully submit independent claim 17 and all claims dependent thereon are in condition for allowance.

*Examiner's response:*

e) The Examiner has addressed applicant's arguments regarding claim 1 in the Examiner's Responses (a) thru (c). See the Examiner's Responses (a) thru (c) above.

***Conclusion***

10. Any inquiry concerning this communication from the examiner should be directed to Qamrun Nahar whose telephone number is (571) 272-3730. The examiner can normally be reached on Mondays through Fridays from 10:00 AM to 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Y Zhen, can be reached on (571) 272-3708. The fax phone number for the organization where this application or processing is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Qamrun Nahar/  
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Primary Examiner, Art Unit 2191  
April 8, 2009